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**PROVISIONAL APPLICATION FOR PATENT COVER SHEET**

Box PROVISIONAL PATENT APPLICATION  
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THIS IS A REQUEST FOR FILING A PROVISIONAL APPLICATION FOR PATENT UNDER 37 C.F.R. § 1.53(c).

JC553 U.S.P.T.O.  
60/179042  
01/31/00**INVENTOR(S)/APPLICANT(S)**

Given Name (first and middle (if any))	Family Name or Surname	Residence (City and Either State or Foreign Country)
Steven Chien-Young	CHEN	7404 Deer Point Court, Derwood, MD 20855

Additional inventors are being named on page 2 attached hereto.

**TITLE OF THE INVENTION (280 characters max)****DIGITAL SUBSCRIBER LINE (DSL) BASED HOME GATEWAY****CORRESPONDENCE ADDRESS**

Please Direct All Correspondence To:

<input checked="" type="checkbox"/> Firm Name	Baker Botts L.L.P.				
Attorney of Record	Robert A. King				
Address	The Warner, Suite 1300				
	1299 Pennsylvania Avenue, N.W.				
City	Washington	State	D.C.	Zip Code	20004-2400
Country	U.S.A.	Telephone	202-639-7700	Facsimile	202-639-7890

**ENCLOSED APPLICATION PARTS (check all that apply)**

<input checked="" type="checkbox"/> Specification	Number of Pages	8	<input checked="" type="checkbox"/> Small Entity Statement
			<input type="checkbox"/> Independent Inventor
			<input checked="" type="checkbox"/> Small Business Concern
			<input type="checkbox"/> Nonprofit Organization
			<input type="checkbox"/> Non-Inventor Supporting Claim By Another
<input checked="" type="checkbox"/> Drawing(s)	Number of Sheets	5	<input type="checkbox"/> Other (specify) _____

**METHOD OF PAYMENT OF FILING FEE FOR THIS PROVISIONAL APPLICATION**

<input checked="" type="checkbox"/> A check in the amount of \$ 75.00 is enclosed to cover the filing fee.
<input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge the filing fee or credit any overpayment to Deposit Account No. 02-0375.

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

No.  
 Yes, the name of the U.S. Government agency and the Government contract number are: \_\_\_\_\_

Respectfully submitted,  
 By \_\_\_\_\_  
 Robert A. King

Date January 31, 2000  
 Telephone 202-639-7700  
 Registration No. 42,738



**VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY STATUS (37 CFR 1.9(f) AND 1.27 (c)) - SMALL BUSINESS CONCERN**

Docket No.  
064591.0107

Serial No.	Filing Date	Patent No.	Issue Date
Not Yet Known	January 31, 2000	N/A	N/A

Applicant/ **Steven Chien-Young CHEN**  
Patentee:

Invention: **DIGITAL SUBSCRIBER LINE (DSL) BASED HOME GATEWAY**

I hereby declare that I am:

- the owner of the small business concern identified below;
- an official of the small business concern empowered to act on behalf of the concern identified below;

NAME OF CONCERN: Aptec Microsystems, Inc.

ADDRESS OF CONCERN: 15800 Crabbs Branch Way, Suite 300, Rockville, Maryland 20855

I hereby declare that the above-identified small business concern qualifies as a small business concern as defined in 13 CFR 121.3-18, and reproduced in 37 CFR 1.9(d), for purposes of paying reduced fees under Section 41(a) and (b) of Title 35, United States Code, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time or temporary basis during each of the pay periods of the fiscal year, and (2).concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both.

I hereby declare that rights under contract or law have been conveyed to and remain with the small business concern identified above with regard to the above identified invention described in:

- the specification filed herewith with title as listed above.
- the application identified above.
- the patent identified above.

If the rights held by the above-identified small business concern are not exclusive, each individual, concern or organization having rights to the invention is listed on the next page and no rights to the invention are held by any person, other than the inventor, who could not qualify as an independent inventor under 37 CFR 1.9(c) or by any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern or organization to which I have assigned, granted, conveyed, or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention is listed below:

- no such person, concern or organization exists.  
 each such person, concern or organization is listed below.

FULL NAME N/A

ADDRESS \_\_\_\_\_

Individual       Small Business Concern       Nonprofit Organization

FULL NAME N/A

ADDRESS \_\_\_\_\_

Individual       Small Business Concern       Nonprofit Organization

FULL NAME N/A

ADDRESS \_\_\_\_\_

Individual       Small Business Concern       Nonprofit Organization

FULL NAME N/A

ADDRESS \_\_\_\_\_

Individual       Small Business Concern       Nonprofit Organization

Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27)

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

NAME OF PERSON SIGNING: Steven Chien-Young Chen

TITLE OF PERSON SIGNING

OTHER THAN OWNER: President, Aptec Microsystems, Inc.

ADDRESS OF PERSON SIGNING: 15800 Crabbs Branch Way, Suite 300, Rockville, Maryland 20855

SIGNATURE: 

DATE: 1/31/00



## DIGITAL SUBSCRIBER LINE (DSL) BASED HOME GATEWAY

### BACKGROUND OF THE INVENTION

#### 5 1. Field of the Invention

The present invention relates to Digital Subscriber Line (DSL) based Home Gateway products.

#### 10 2. Description of Related Art

With the advent of the communication technologies and breakthroughs in Digital Signal Processing (DSP), DSL, and Wireless, more bandwidths are now available for home communications than were once provided by traditional voice-grade analog modems. Because of this, there is widespread interest among home users in faster access to content provided by service providers via high-speed facilities such as DSL, cable, and wireless. This interest appears to be driving the evolution of the home communications from narrow band applications to broadband applications.

Before DSL, broadband access via shared Local Area Network (LAN), Frame Relay or Asynchronous Transmission Mode (ATM) has only been used by commercial or business applications, while most to-home communications are narrow band and use either Integrated Service Digital Network (ISDN) line or analog modems. Besides the difference in bandwidth, another key difference between narrow band and broadband communications is operational complexity -- the service provisioning process is required by the broadband applications. Normally, a trained professional is required in the office environment to manage such complexity. It is undesirable and costly, however, to have trained networking personnel managing a home network.

Figs. 1 and 2 depict known home gateway devices for high-speed communications. Fig. 1 depicts a personal computer interface (PCI) based ASDL home gateway, while Fig. 2 depicts a stand-alone ASDL home gateway. These gateway devices are similar to those that are commonly used in offices. In other words, the function and the design of today's home networking device, i.e., home gateway, is directly related to the one used in the office environment today. Thus,

- the known devices are complex, and difficult to use. In addition, home users are required to install Ethernet cables to connect PCs to form a LAN in order to share resources. Home users are also required to install software provided by the vendor for configurations, and to recognize the difference and the type of interfaces.
- 5 Finally, information accesses, and in particular, the Internet, is only available through a PC, which is connected to the gateway.

### SUMMARY OF THE INVENTION

Therefore, a need has arisen for a home gateway that overcomes these and  
10 other disadvantages of the related art.

One embodiment of the present invention integrates a DSL modem, an analog modem, a wireless interface, and a home phone network interface into a screen-phone for the broadband communication service to home users. Multiple users are able to access the Internet and the content services for conducting e-commerce, receiving content news, entertaining on-demand, making audio or video communications, and telecommuting or working at home. This screen-phone based  
15 DSL home gateway allows in-home communications for the purpose of resource sharing among home computing devices via the existing but not limited to phone wire, wireless or cable.

20 The complexity of the broadband equipment, such as DSL home gateway, used in the home environment is minimized, without sacrificing the communication capability. In particular, embodiments of the present invention:

- Hide the Internet Routing Protocol based LAN concept from the typical home users.
- 25 • No Internet Protocol (IP) router or bridge device should be visible to the home users
- Provide automatic service provisioning and configurations
- May provide the Plug-and-Play connection to home based electronics devices, which include, but not limited to, a WEB pad, a cellular phone, lap-top or notebook computer, desk-top PC, personal data access (PDA) device, smart appliances, TV, alarm system, etc.

### BRIEF DESCRIPTION OF THE DRAWINGS

- Fig. 1** is a schematic of a PCI-based ADSL Home Gateway.
- Fig. 2** is a schematic of a stand-alone ADSL Home Gateway.
- Fig. 3** is a schematic of a phone-based and Integrated Home Gateway.
- 5      **Fig. 4** is a schematic of a phone-based Wireless only Home Gateway.
- Fig. 5** is a schematic of phone-based Home Gateway Components.

### DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Embodiments of the present invention and their technical advantages may be  
10 better understood by referring to **Figs. 1 through 5**, like numerals referring to like  
and corresponding parts of the various drawings.

Referring to **Fig. 3-5**, a home gateway product according to one embodiment  
of the present invention is provided. In order to hide the complexity of the device  
from the ordinary home user, no configuration and no IP router, or bridge devices,  
15 are visible to home users. To accomplish this, the traditional stand-alone IP specific  
router or bridge device is removed from the home environment. All the home  
gateway functions are integrated into an existing home-friendly device. In one  
embodiment, this may be a telephone set with a display screen (screen phone).

A removable display unit for displaying and accessing both Internet and  
20 voice messages may be provided. Home users may subscribe the specific  
information from the Internet content provider and display them on the screen  
through an always-on Internet access. For example, home users may, but not limited  
to, subscribe the following for the display: the real-time stock quote, weather,  
headline news, community news, yellow pages through the service providers. This  
25 removable display unit is also a personal portable device and can be operated outside  
of the house via the wireless communications.

In one embodiment, the removable display may be a connected organizer  
with a display, such as the Palm connected organizers, manufactured by 3Com. In  
another embodiment, a CRT may be used to display the data.

30      In another embodiment, the display may comprise a touch-sensitive screen  
for entering data or information. Other suitable input devices may be used.

In one embodiment, home electronic devices, such as a WEB pad, a cellular phone, a lap top or notebook computer, a desk top personal computer, a PDA, smart appliances, alarm systems, home video monitoring equipment, etc. may interface with the device through modular host interfaces. These may use the plug and play configuration.

The modem unit may include both DSL and analog modems. A DSL modem (DSL Remote Terminating Unit), may include one of the following: ADSL, SDSL, HDSL and VDSL, and may be integrated inside a phone set (Gateway), which provides an always-on Internet connectivity. An analog modem, such as V.90 56Kbps using POTS channel, may be also integrated inside the phone set (Gateway) for the purpose of providing the channel redundancy, the broadband service provisioning and configuration.

Referring to Fig. 4, this figure shows a flexibility of this invention to operate on the wireless interface and to connect home devices through a plugging Radio interface. Similar operation applied to other interfaces such as home phone line, cable, and satellite. This invention allows multiple interfaces coexisted in the home gateway.

According to one embodiment of the present invention, modular Plug-and-Play and turn-key interfaces may be included for connecting home devices via the existing phone line, power line, wireless or cable. One or more interfaces may coexist at the same time based on the need of a particular home environment. The home devices include, but not limited to, desk-top PC, lap-top notebook, home security device, cellular phone, personal data access device, smart IP-based home appliance, printer, facsimile machine, scanner, etc.

In another embodiment, an embedded video camera for video communications may be provided. An embedded video camera may provide the capability for video conferencing, either one-to-one or one-to-many persons, medical diagnostics, security monitor, etc. These applications are available to home users whenever the services are available through the Internet connection. In addition, a user may remotely monitor a single or multiple areas through the Internet.

While the invention has been described in connection with preferred embodiments and examples, it will be understood by those skilled in the art that other variations and modifications of the preferred embodiments described above may be made without departing from the scope of the invention. Other 5 embodiments will be apparent to those skilled in the art from a consideration of the specification or practice of the invention disclosed herein. It is intended that the specification is considered as exemplary only, with the true scope and spirit of the invention being indicated by the following claims.

CLAIMS

What is claimed is:

- 5           1. A home gateway interface, comprising:  
               a communication interface for connecting to a network;  
               a processor for processing information from the network;  
               a display for displaying the information.
- 10           2. The home gateway interface of claim 1, wherein the communication  
               interface is selected from the group consisting of POTS, DSL, and  
               combinations thereof.
- 15           3. The home gateway interface of claim 1, further comprising:  
               at least one module for interfacing with an external device.
- 20           4. The home gateway interface of claim 3, wherein the external device  
               is selected from the group consisting of a desk-top PC, lap-top  
               computer, notebook computer, a home security device, a cellular  
               phone, a digital phone, a personal data access device, a smart IP-  
               based home appliance, a printer, a facsimile machine, a scanner, a  
               connected organizer, and combinations thereof.
- 25           5. The home gateway interface of claim 1, further comprising a multi-  
               function handset.
6. The home gateway interface of claim 5, wherein the multi-function  
               handset performs the function of at least one of a cordless phone, a  
               mobile phone, a web phone, and a walkie-talkie.
- 30           7. The home gateway interface of claim 1, wherein the communication  
               interface includes at least one of DSL modem and an analog modem.

8. The home gateway interface of claim 7, wherein the DSL modem includes at least one of ADSL, SDSL, HDSL and VDSL.
- 5 9. The home gateway interface of claim 1, comprising modular plug-and-play interfaces.
- 10 10. The home gateway interface of claim 9, wherein the modular plug-and-play interfaces connect home devices via at least one of an existing phone line, a power line, wireless or cable.
- 15 11. The home gateway interface of claim 1, wherein the display comprises a removable display unit
12. The home gateway interface of claim 11, wherein the removable display unit interfaces with the home gateway interface through wirelessly.
- 20 13. The home gateway interface of claim 12, wherein the removable display unit interfaces with the home gateway interface through at least one of IR and RF communications.
14. The home gateway interface of claim 1, wherein the display displays and accesses at least one of Internet messages and voice messages.
- 25 15. The home gateway interface of claim 1, wherein the display displays at least one of a real-time stock quote, weather, headline news, community news, and yellow pages.
- 30 16. The home gateway interface of claim 1, further comprises an video camera.

**DIGITAL SUBSCRIBER LINE (DSL) BASED HOME GATEWAY****ABSTRACT OF THE DISCLOSURE**

5

A digital subscriber line based home gateway is disclosed. According to one embodiment of the present invention, a DSL modem, an analog modem, a wireless interface, and a home phone network are integrated to interface into a screen-phone for the broadband communication service to home users. Multiple users are able to 10 access the Internet and the content services for conducting e-commerce, receiving content news, entertaining on-demand, making audio or video communications, and telecommuting or working at home. This screen-phone based DSL home gateway allows in-home communications for the purpose of resource sharing among home computing devices via the existing but not limited to phone wire, wireless or cable.

15



# Figure 1: PCI based ADSL Home Gateway

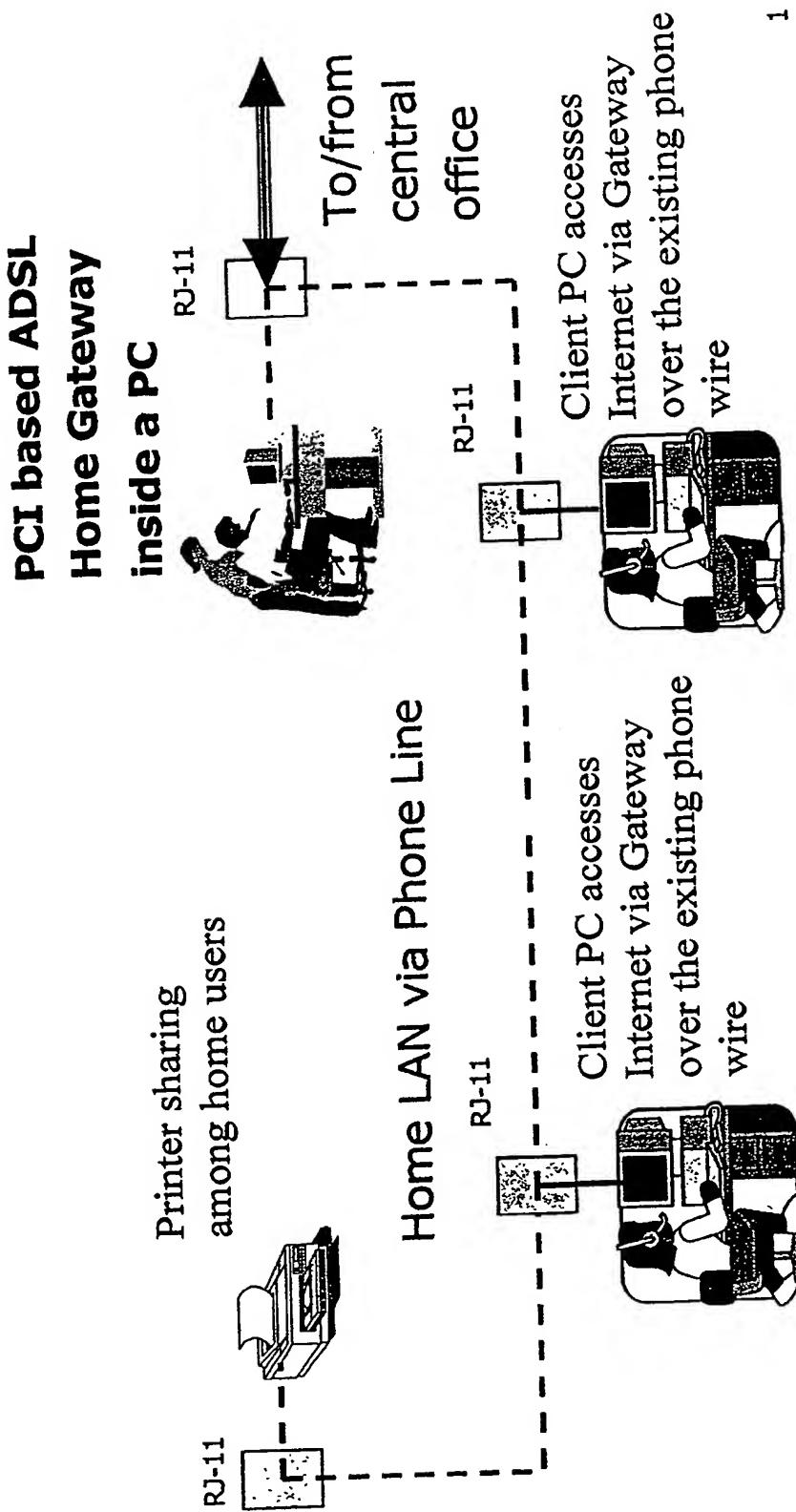
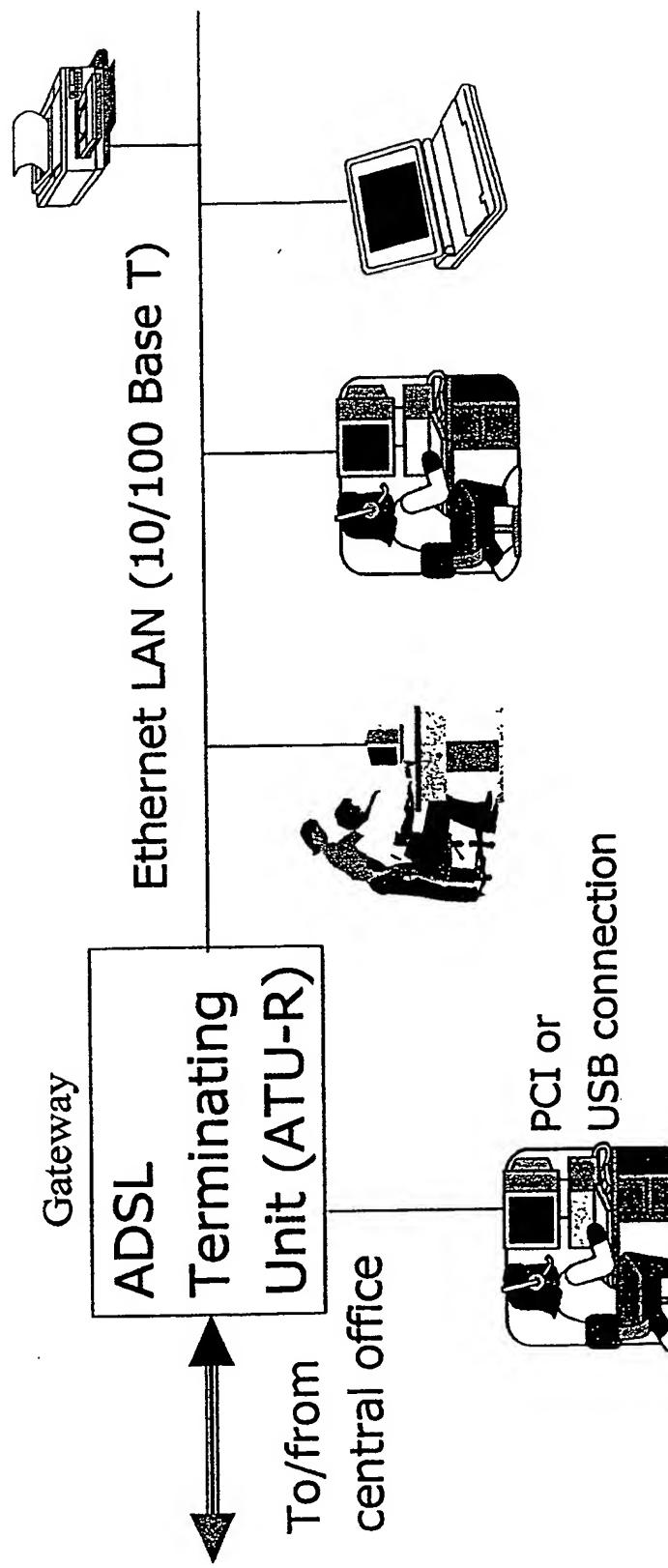
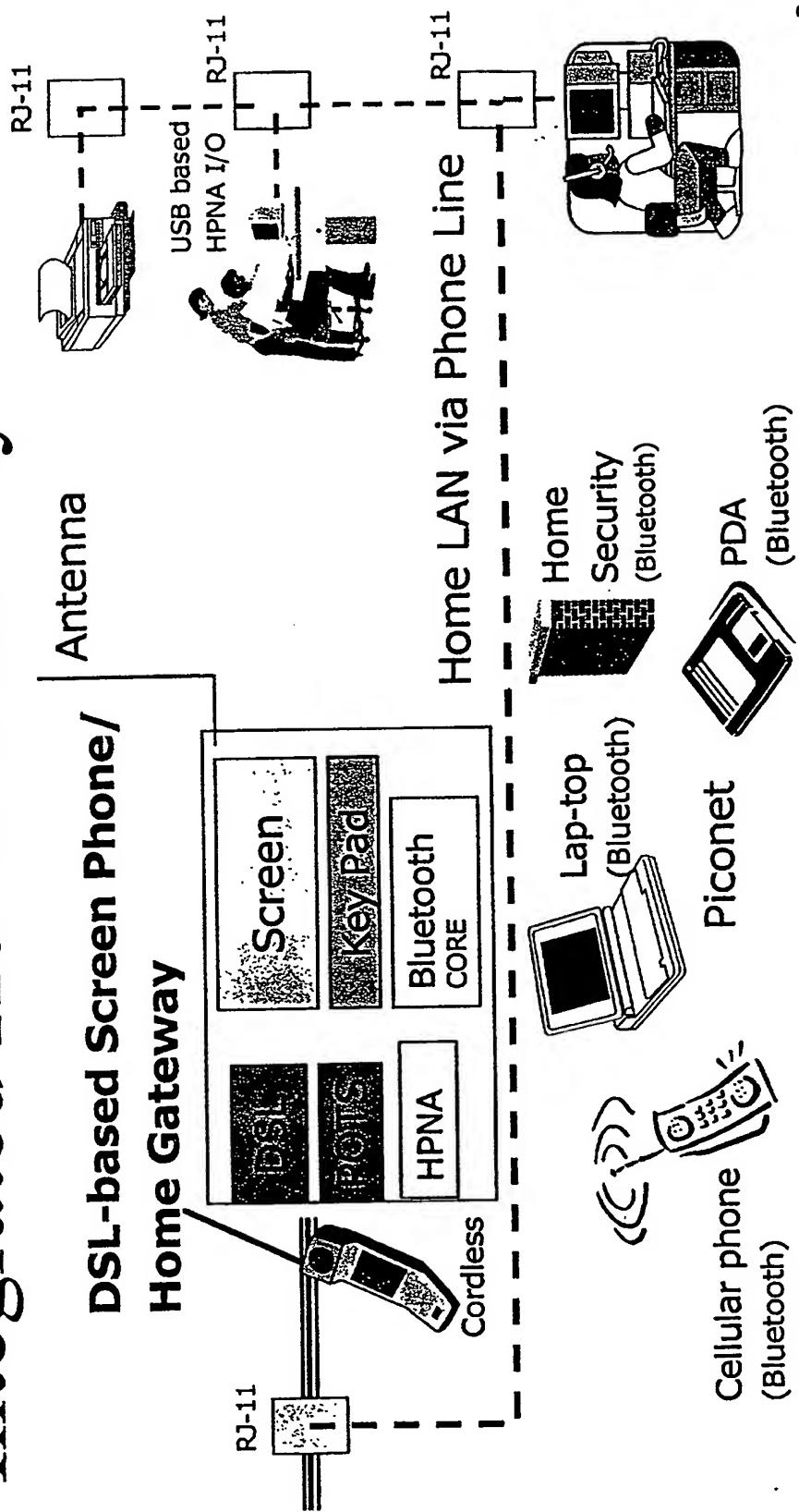


Figure 2: Stand-alone ADSL Home Gateway

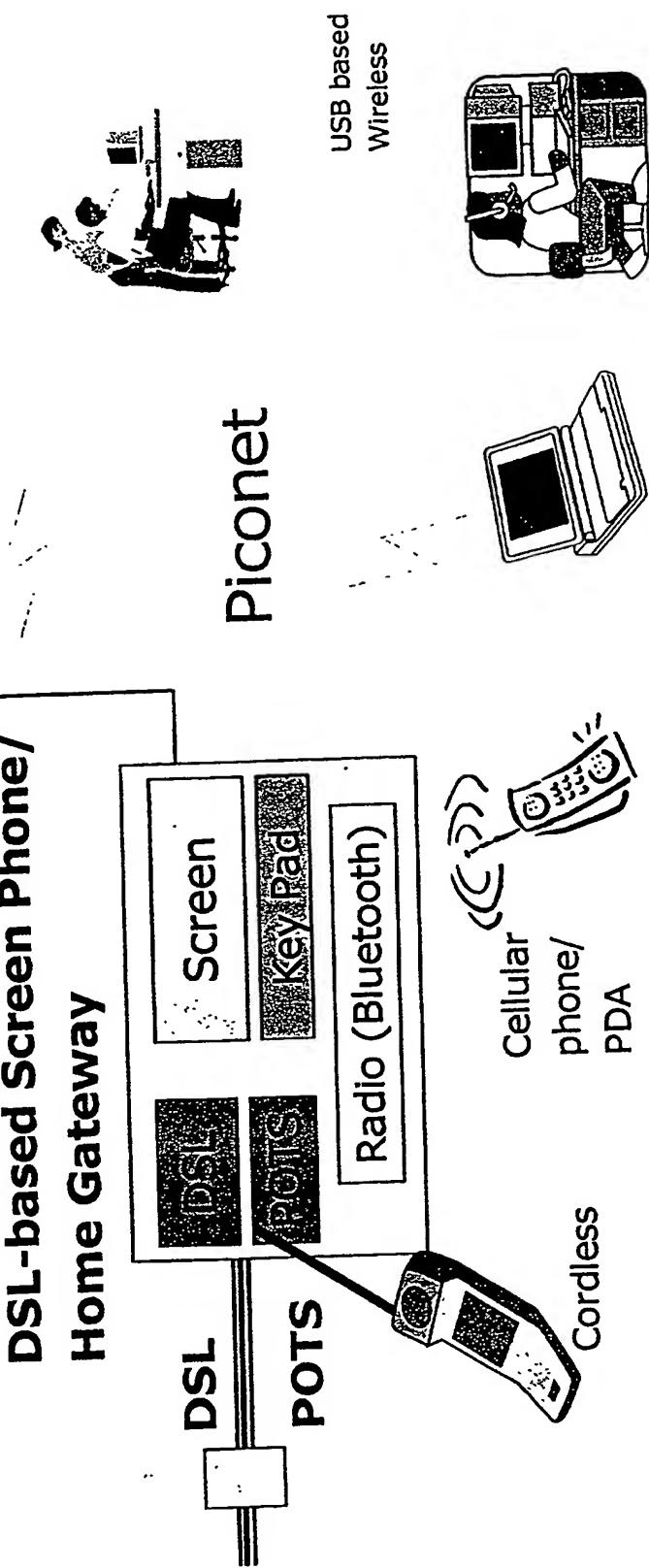


# Figure 3: Phone-based and Integrated Home Gateway



Digitized by srujanika@gmail.com

# Figure 4: Phone-based Wireless Only Home Gateway



# Figure 5: Phone-based Home Gateway Components

